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EFFECTS OF HIGH-PROBABILITY REQUESTS ON THE ACQUISITION AND GENERALIZATION OF RESPONSES TO REQUESTS IN YOUNG CHILDREN WITH BEHAVIOR DISORDERS

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The failure to respond to requests in young children often is maintained by the reactions of the adults that encounter this behavior. This failure to respond to requests has been identified as a primary reason for the children's exclusion from community, social, and instructional opportunities. Numerous interventions that target the failure to respond have consisted of punishment and reinforcement procedures. More recently, antecedent interventions have focused on changing the context in which a request is delivered. In the current study, high-probability requests were provided as an antecedent to delivering a low-probability request. The requests were delivered by multiple trainers in an attempt to produce generalized appropriate responding to adults who did not use the high-probability sequence. Results showed an immediate increase in appropriate responding in 2 children when the intervention was delivered. In addition, when the intervention was implemented by more than one adult, spontaneous increases in responding also were observed toward adults who had never implemented the request sequence. Improvements in responding to requests were maintained after the intervention was discontinued.

DESCRIPTORS: behavioral momentum, generalization, aggression, behavioral disorders

The failure to respond to requests is found in all children, to some degree, throughout childhood. This can be as simple as ignoring or not following instructions made by a parent or performing behaviors other than the one requested (Haring, Liberty, & White, 1980), or as complex as using aggressive or self-injurious behavior, discrepant language, or intense stereotypic behavior to avoid complying to requests (Carr & Durand, 1985; Carr, Newsom, & Binkoff, 1976; Volkmar & Siegel, 1979). In children with serious behavior disorders, this failure to respond renders independent functioning, socialization, and classroom learning difficult. Several researchers have shown that excessive nonresponse by children has a negative impact on adults who interact with these children, often resulting in decreased opportunities to participate in normal activities (Carr, Taylor, & Robinson, 1991; Wahler & Dumas, 1986). Indeed, Carr et al. (1991) demonstrated that individuals who exhibit extreme rates of nonresponse to simple instructional mands effectively punish teachers' instructional interactions. In children with disabilities, this pattern of behavior is often used to support their exclusion from typical learning environments (Brady, McDougall, & Dennis, 1989).

Responding to a request is, of course, crucial as a foundation of instructional and social interaction (Engelmann & Colvin, 1983). In his research on families, Patterson (1982) found that children learn excessive nonresponse patterns to control social situations and escape demands. Adults' reactions often serve to maintain the failure to respond across time and settings. For many years, however, the knowledge of this dynamic has not governed explorations of interventions designed to influence appropriate responding. The literature in behavior analysis, special and general education, and early intervention is replete with strategies used to increase responding to requests, including punishment (or other behavior-reductive tactics) and tan-

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gible reinforcement procedures. There is little question that these trainer-applied contingencies can develop stimulus control over compliance. Unfortunately, there typically are at least two unintended effects of these procedures. The intervention itself often becomes the stimulus that controls responding to a request rather than the original request for action (see Haring & Kennedy, 1990; Parrish, Cataldo, Kolko, Neef, & Egel, 1986), and other forms of coercion often replace the original failure to respond (i.e., side effects; Doleys, Wells, Hobbs, Roberts, & Cartelli, 1976; Macfarlane, Young, & West, 1987).

Behavioral Momentum as an Antecedent Strategy

Recently, a few researchers have examined antecedent interventions that (a) identify the stimulus that controls the failure to respond to requests and (b) attempt to change the antecedents that occasioned the inappropriate (nonresponsive or coercive) behaviors. For example, Carr et al. (1976) reduced self-injury by changing the antecedents in which requests were given. The authors referred to this as "embedding requests." Similarly, a theory of behavioral momentum (Nevin, Mandell, & Atak, 1983) has been used by a number of researchers to devise a technique (referred to as pretask requesting, high-probability requests, or interspersed requests) that (a) increased the probability of compliance, (b) decreased stereotypic behavior, and (c) decreased self-injury. Nevin et al. noted similarities in a behavior's resistance to change and the momentum of objects in motion. Nevin et al. suggested that a behavior's resistance to change (i.e., response strength) is analogous to behavioral mass and response rate to behavioral velocity. Recently, researchers have devised an antecedent procedure consisting of a rapid series of short, easy requests administered just prior to a request that historically occasioned the failure to respond and that were often accompanied by aggressive behaviors (Harchik & Putzier, 1990; Horner, Day, Sprague, O'Brien, & Heathfield, 1991; Mace & Belfiore, 1990; Mace et al., 1988; Singer, Singer, & Horner, 1987). This sequence of requests has been used to create what Nevin et al. referred to as *behavioral momentum*. The high-probability request sequence ("high p") established a high rate of reinforcement for the response class compliance that increased its momentum and carried over to tasks with a low probability ("low p") of performance.

The present study extended the previous work in behavioral momentum (interspersed high-probability requesting). To date, this intervention has not been packaged with other interventions to promote generalized compliance. Hence, this study sought to investigate the effects of high-p requests used by multiple trainers on both the acquisition and generalization of responding to low-p requests of young children with severe disabilities. Specifically, we asked: Does the use of high-probability requests prior to a low-probability request increase the percentage of responding of young children with severe behavior disorders? If increases in appropriate responding are obtained, will the use of multiple trainers result in generalized responding to adults who do not implement the high-p request sequence? Will any increases in responding to requests be maintained once the intervention is removed?

METHOD

Participants

The participants were 2 boys with behavior disorders and severe disabilities. Bobby, 7 years old, was diagnosed with Down syndrome. Standardized test results included the Stanford Binet (<40), Expressive One Word Picture Vocabulary Test (mental age = 2.5 years), and Vineland (age equivalent <2–8). Due to unintelligible articulation patterns, Bobby communicated through the use of sign language. Bobby's failure to respond when asked to perform a task was accompanied by screaming, hitting, kicking, emptying cabinets and drawers, spitting, throwing furniture, ignoring, and stereotypic behavior such as flapping objects in front of his face. Teachers stated that they had been unable to find a reliable reinforcer or punisher in the year and a half he had been enrolled in the school. Prior to the study, only consequent interventions, including physical restraint, seclusion, and social dis-

approval (i.e., shouting and signing), had been implemented; however, none of these were effective.

Darren, 5 years old, was identified as autistic and mentally retarded. Standardized test results included the Leiter (60) and Autistic Behavior Checklist (severe). Darren's failure to respond when asked to perform any task was accompanied by yelling, hitting, kicking, enuresis, laughing, throwing furniture, and stereotypic behavior in the form of "rap" noise. Other than physical restraint, teachers and instructional aides had been unable to find a procedure to control consistently Darren's aggressive and dangerous behavior. At the time of the study, a shading procedure had been recommended by the consulting behavior management specialist. However, it was observed by the authors that this procedure intensified Darren's behaviors and thus was discontinued prior to the beginning of the study.

Settings

Both boys were enrolled in life skills programs located on regular school campuses. Bobby's classroom was part of a large area (5 m by 5 m) divided into four classrooms. The classrooms were divided by a wall of paneling extending from the floor to approximately 0.6 m below the ceiling. Openings in the paneling served as entrances from one room to another, allowing Bobby to wander from classroom to classroom (which he did during episodes of escalated aggression). Darren's room was located on a regular education wing. Two of the walls in this room were solid (one was brick and the other was a chalkboard), the third wall consisted of open cabinets, and the fourth wall was made up of glass windows overlooking an open area. This room was approximately 6 m by 6.25 m.

Trainers

All sessions and trials for both boys were conducted by two special education teachers, one instructional aide, and one graduate student assistant (a total of four trainers per student) in the students' classrooms. Although all four delivered the low-*p* requests, only three delivered the high-*p* request sequence for Bobby and two delivered high-*p* requests to Darren. Two procedures were used to prepare the adults to use the momentum sequence. First, the trainer read a written description of the procedures and an investigator answered any questions. Second, the trainer practiced the procedure in a role-play situation while the observers collected data. This allowed the trainer to receive feedback on the requests and the mechanics of the procedure (interprompt time and reinforcement schedule). Training took place for each trainer 1 day prior to the implementation of the high-*p* condition to ensure purity of the baseline procedures.

Behavioral Measures

*Dependent variable (low-*p *requests).* For this study, the dependent variable was the percentage of responses to low-*p* requests to which the children responded without the presence of interfering behaviors. Low-*p* requests were those requests with which the participants were unlikely to respond. Low-*p* requests were obtained by (a) examining the children's individual educational programs (IEP), (b) asking the teachers, aides, and parents, and (c) conducting informal observations.

Before assigning them to the low-*p* pool, the low probability of performing these requests was confirmed by asking each child to perform the identified tasks during regular instruction. This also assured that nonperformance of the task was a failure to respond rather than lack of acquisition. Responding to a request was defined as the initiation of a task within 10 s of a request by the trainer without exhibiting one of the accompanying behaviors, coupled with task continuation and completion. For example, a response to one of Bobby's low-*p* requests ("sit down in your chair") included (a) moving toward a chair within 10 s of the request without one of the accompanying behaviors and (b) sitting in it. Ten separate trials were conducted for each request. Those requests yielding a failure to respond five times or more were considered low *p*. Although the low-*p* requests designated for each student were limited to simple requests, these requests represent the initiation of a sequence of more functional activities (i.e., "come here" was the first step to lining up for the bus, "stand up" was the

Table 1
High-*p* and Low-*p* Requests for Each Participant

Participant	Low-*p* requests	High-*p* requests
Bobby	Come here.	Touch your hair.
	Sit down in your chair.	Touch your head.
	Stand up.	Touch your hand.
	Give me the . . .	Touch your eyes.
	Pick up the . . .	Touch your ears.
		Touch your nose.
		Touch your chair.
		Touch the floor.
		Touch the desk.
		Touch the wall.
		Touch the cabinet.
Darren	Stand up.	Touch your head.
	Sit down here.	Touch your eyes.
	Put up the . . .	Touch your ears.
		Touch your back.
		Give me five.
		Clap your hands.
		Touch your mouth.
		Touch the puzzle.
		Touch the sticker.

first step to getting the student off the floor). Additionally, due to the limited receptive language skills of the students, the requests were kept to simple two- and three-word requests. See Table 1 for a list of low-*p* requests.

Anecdotal data indicated that the accompanying problem behaviors were a function of escape from requests. When interviewed, the teachers and aides informed the investigators that they rarely requested the students to respond and participate due to the aggressive behaviors that any type of request occasioned. In addition, informal observations were conducted by an investigator and a data collector for 1 week prior to the initiation of the intervention procedures. This included (a) a description of the events immediately prior to the students' problem behaviors, (b) the time of occurrence of the behavior, and (c) the events immediately following the behavior. Information obtained in these informal observations supported the hypothesis that the problem behaviors served as an escape from responding to a request.

*Independent variable (high-*p *requests).* The independent variable was a series of high-*p* requests administered immediately prior to each low-*p* request. High-*p* requests were instructions or requests with which the children had a history of complying or performing. The success of each high-*p* request was confirmed similarly to low-*p* requests. Those requests which yielded appropriate responding at least 80% of the time were considered high-*p* requests. The identified pool of high-*p* requests was limited due to the students' limited receptive language skills and the number of requests that resulted in appropriate responding at least 80% of the time. See Table 1 for a list of high-*p* requests.

Data Collection

Data were collected during two 6-min sessions per trainer for Bobby and during three 5-min sessions per trainer for Darren. These sessions were conducted Monday through Friday except for school holidays. Data were collected by a trained observer for (a) response to low-*p* and high-*p* requests, (b) emission of low-*p* and high-*p* requests by trainers, and (c) interprompt time. Percentage of appropriate responses was calculated separately for high-*p* and low-*p* requests by dividing the number of responses to requests by the total number of daily requests administered by a trainer. Data on trainer requests were also recorded to establish the accuracy with which the trainer implemented the procedure across sessions. Specific data included (a) the type of request (i.e., low *p* or high *p*), (b) the verbal emission of the request, and (c) interprompt interval.

Interobserver agreement. Interobserver agreement data were collected concurrently but independently on all conditions and variables. Recording appropriate responding to the low-*p* and high-*p* requests involved a second observer placed no more than 3 m from the primary observer who independently recorded data during the trials. Agreement coefficients were determined by dividing the number of agreements by the number of agreements and disagreements. Agreement checks were taken on 28% of Bobby's sessions and 29% of Darren's sessions. Interobserver agreement data also were collected on procedural reliability during delivery of the low- and high-*p* requests on 28% of Bobby's sessions and 29% of Darren's sessions. Data collected included (a) the interprompt time and (b) the emission of verbal requests to prevent

vague requests that would have been a measure of misunderstanding rather than failure to respond. If the two observers recorded times within 2 s, an agreement for interprompt time was scored.

Experimental Design

The effects of high-*p* requests on the percentage of responses to low-*p* requests were evaluated using a multiple baseline design across trainers. A concurrent baseline was conducted for trainers who did not deliver high-*p* requests. This design permitted an evaluation of generalization across trainers. That is, increased responses to low-*p* requests with a trainer who did not implement the momentum sequence was considered evidence of generalization across trainers (i.e., spontaneous increases to "unprogrammed" persons). Finally, follow-up probes assessed whether or not the high-*p* sequence was still effective after the intervention.

Procedures

Baseline. During baseline, various adults delivered low-*p* requests to the students. If the student responded to the request within 10 s, he was presented with verbal praise paired with gestural or physical contact (e.g., "way to go" paired with a pat on the back). For Bobby, the verbal praise was paired with hand scratching (the aide or teacher lightly scratching the palms of Bobby's hands) on an intermittent basis. This had previously been determined by the teacher to be the "only thing that would calm him down." If the student failed to respond to the low-*p* request, the trainer repeated the low-*p* request and then walked away. Trials were implemented on a variable schedule averaging 1 min. All trials were conducted during morning instructional activities. For Bobby, two daily sessions, five trials per session, were conducted by each trainer (i.e., a maximum of 40 trials per day, eight sessions per day). Each session lasted approximately 6 min with at least a 10-min break between each session. That is, the total time spent conducting trials ranged from 30 to 60 min, interspersed across a 3-hr block of instructional time. The order of these sessions was randomly predetermined such that no trainer conducted two sessions consecutively. (However, on Days 1, 3, 4, 5, 8, 13, 15, and 18, the order of the two sessions was not followed due to alterations in the classroom schedule. On these days, no trainer implemented her sessions consecutively.)

Sessions for Darren were scheduled three times daily. Each trainer conducted two sessions of three trials each and one session of four trials (i.e., a maximum of 40 trials per day, 12 sessions per day). Each session lasted approximately 3 to 4 min, with at least a 5-min break between each session. As with Bobby, the order of these sessions was randomly predetermined such that no trainer implemented his or her sessions consecutively.

It should be noted that prior to the study both students engaged in very limited amounts of instruction during their morning classes due to their nonresponsiveness and aggression. Thus, for both students, baseline was designed to provide three 5-min instructional activities. During the remainder of the morning class time, the participants were allowed to move freely around the classroom and choose activities as long as they did not interrupt the instructional lesson for the entire class. The procedures for this study were interspersed across a 3-hr period, but instructional activities were not interrupted. This reflected prestudy conditions.

Intervention. The setting, context of the activities, and the contingencies remained the same as in baseline. A pool of high-*p* requests was determined prior to implementation of this phase. During the intervention with Bobby, an investigator stood behind the student and cued the trainer with index cards to initiate the sequence of high-*p* requests. The index cards were color coded such that all high-*p* requests were on white cards and all low-*p* requests were on yellow cards. This cueing procedure was faded out for all trainers by Day 22. For Darren, these cards became distracting almost immediately. Instead, a coauthor positioned herself behind Darren and cued the trainers by hand to deliver high- and low-*p* requests. The high-*p* request sequence was delivered immediately prior to the presentation of each low-*p* request. The sequence of events during the high-*p* requests included (a) delivering three to five high-*p* requests rapidly just prior to administering each low-*p* request, (b) delivering verbal or gestural praise

(thumbs up, waving hands in the air) for each response to a high-*p* request, and (c) delivering the low-*p* request within 5 s of reinforcing a response to the last high-*p* request. The trainer began each high-*p* sequence with three high-*p* requests. In the event that a high-*p* request yielded a nonresponse, the trainer continued to deliver high-*p* requests until two consecutive responses were scored before issuing a low-*p* request. The time between high-*p* requests ranged from 3 to 8 s. It should be noted that the high-*p* sequence was not used by any other school personnel or at any time other than during a trial of the intervention phase.

Follow-up. Follow-up probes were conducted at 1-week intervals for Bobby, beginning 2 weeks after Session 25. For Darren, follow-up probes were conducted for 5 continuous days. After this, four additional probes were conducted once per week. During all follow-up sessions, all conditions reflected those in place during baseline. That is, trainers delivered only low-*p* requests. Again, all performance and nonperformance contingencies remained the same.

RESULTS

Interobserver Agreement

Interobserver agreement was calculated for each behavior that students displayed. Agreement for both Bobby and Darren was 100% for responding to high-*p* requests and 100% for responding to low-*p* requests for all sessions. Interobserver agreement for the procedural emissions of the low-*p* and high-*p* requests was 100% for all sessions for both boys. That is, the observers recorded the exact wording of the requests with 100% reliability for all requests given. Agreement checks on the time between the last high-*p* request and the low-*p* request was 98% (range, 93% to 100%) for Bobby and 99% (range, 97% to 100%) for Darren.

Responses to Teacher Requests

The data on percentage of appropriate responses to low-*p* and high-*p* requests collected for both Bobby and Darren are depicted in Figures 1 and 2, respectively.

Bobby's results. During baseline (Days 1 through 4), Bobby's percentage of responding to low-*p* requests was low and stable across all four trainers (M = 6.7%). On Days 5 through 11, the high-*p* request condition was implemented by the first trainer. All other trainers maintained baseline conditions. Bobby's responses to low-*p* requests issued after the high-*p* sequence increased steadily (range, 0% to 50%). For all other trainers, Bobby's responses to low-*p* requests remained stable at low baseline levels.

Beginning on Day 12 and continuing through Day 16, Trainers 1 and 2 implemented the high-*p* sequence just prior to the issuance of each low-*p* request. Bobby's responses to low-*p* requests for Trainer 1 remained stable on Days 12 to 15, then increased to 80% on Day 16. On Day 12, when Trainer 2 implemented the high-*p* condition, responses to low-*p* requests showed a strong increase that continued through Day 16 (M = 58%). Responses to high-*p* requests for Trainers 1 and 2 remained at consistently high levels. During these days, Trainers 3 and 4 continued with baseline procedures, which resulted in consistently low percentages (M = 6.6%, 0%).

Finally on Day 17, Trainer 3 also initiated the use of high-*p* requests concurrently with Trainers 1 and 2. On this day, Bobby's responses to Trainers 1 and 2 increased and remained at consistently high levels for the remainder of the study (M = 93%, 90%). Trainer 3's first day of intervention yielded a substantial increase to 70% responses to low-*p* requests. This continued to increase and remained stable through Day 25. While maintaining baseline conditions, data collected for Trainer 4 showed an initial increase to 20%, 50%, and 90% responses to low-*p* requests for Days 17, 18, and 19, respectively. Trainer 4 was absent from the classroom for Days 20 and 21. However, for Days 22 through 25, Bobby's percentage increased to levels consistent with the three trainers who were implementing the high-*p* sequence.

Two weeks following Session 25, data for the first weekly follow-up probe were collected. These data yielded responses to low-*p* requests of 100%, 100%, 90%, and 100% for Trainers 1, 2, 3, and 4, respectively. The second, third, and fourth follow-up probes (conducted at 1-week intervals) re-

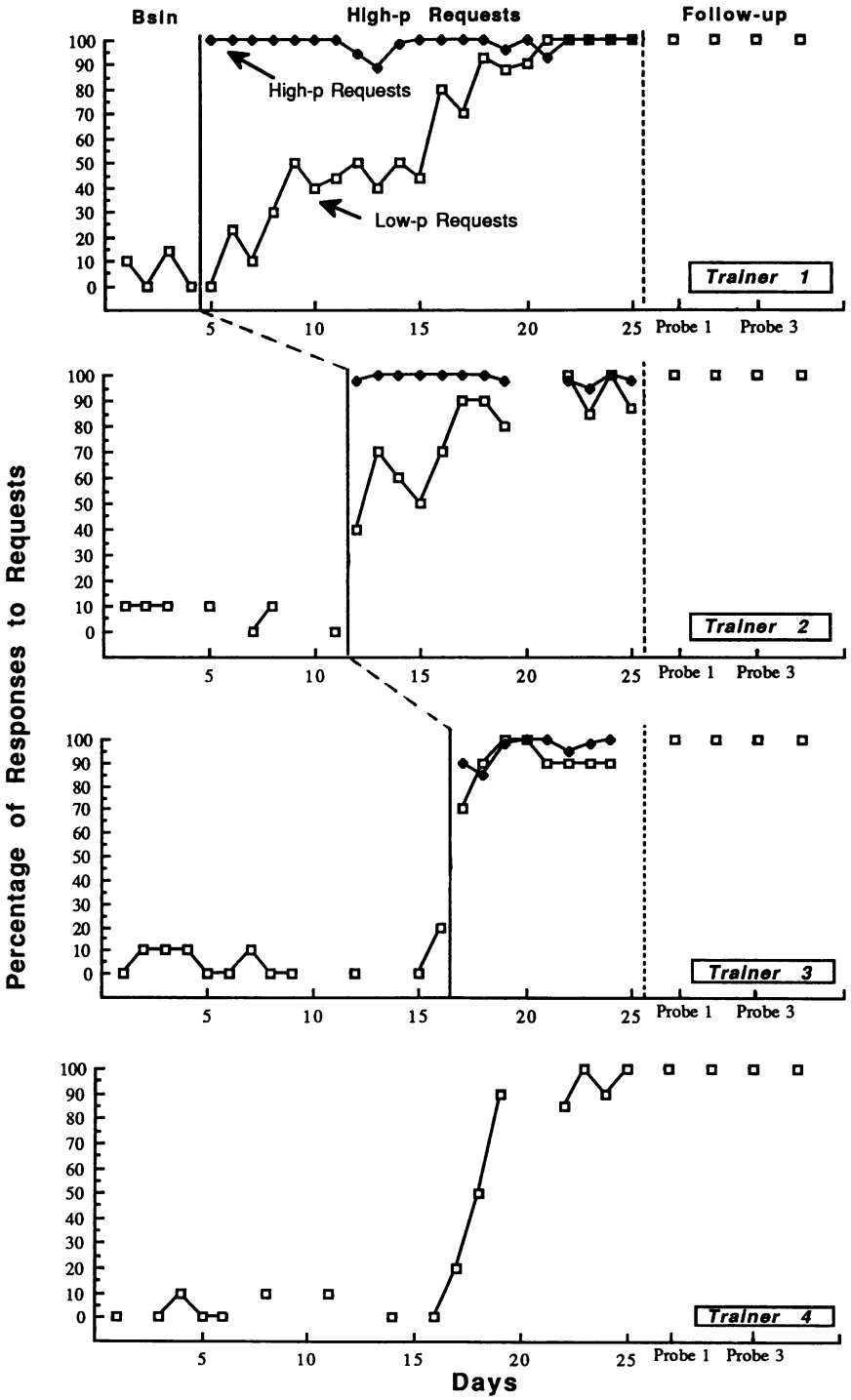

Figure 1. Percentage of Bobby's responses to low-*p* and high-*p* requests. The follow-up probes were collected at 1-week intervals.

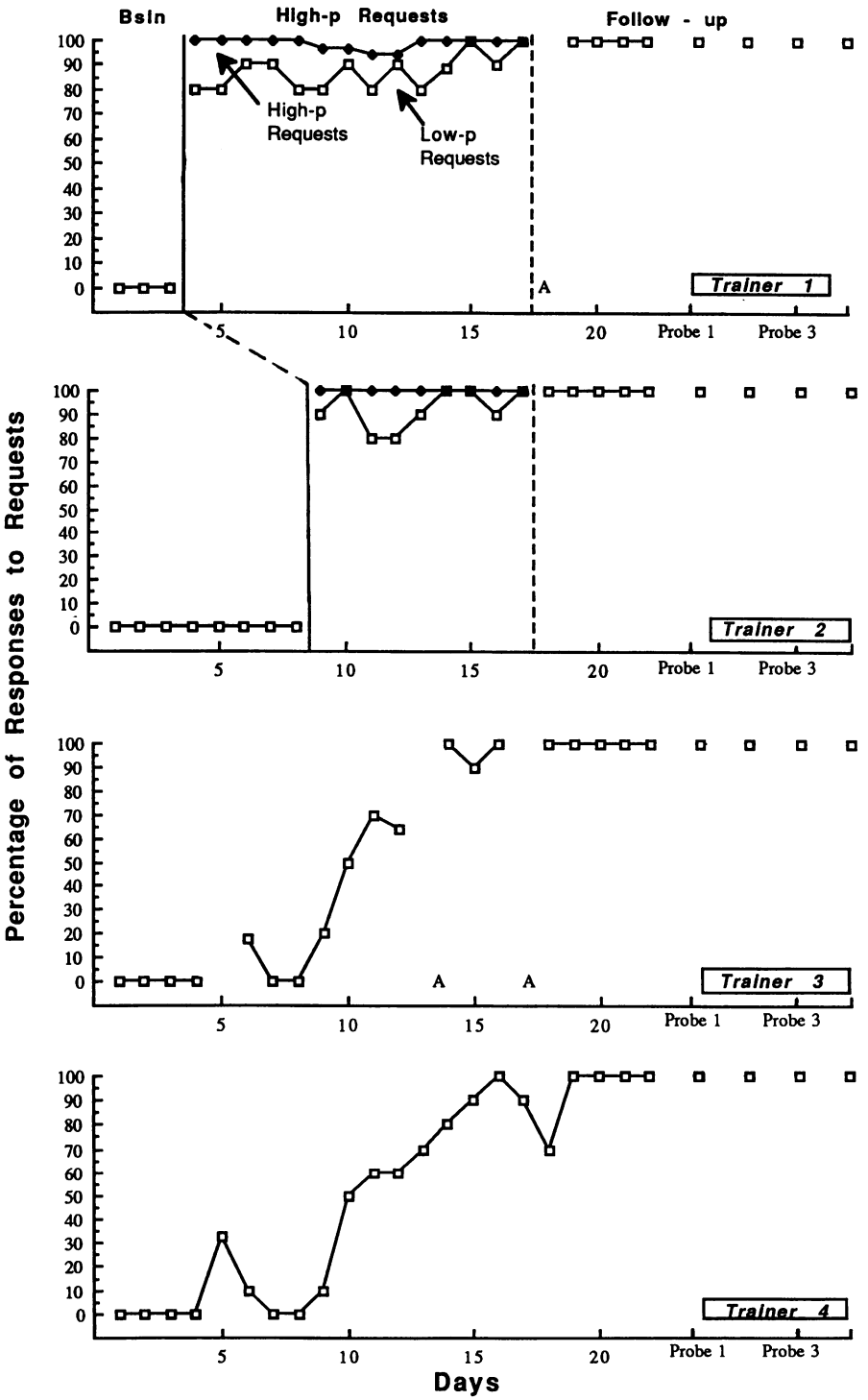

Figure 2. Percentage of Darren's responses to low-*p* and high-*p* requests. The follow-up probes were collected at 1-week intervals. The letter "A" represents days in which Darren was absent and no data were collected.

vealed 100% responses to low-*p* requests implemented by all trainers.

Darren's results. Darren's compliance to low-*p* requests was stable, with 0% responses to requests for all trainers for all 3 days of baseline. The high-*p* request sequence was implemented by the first trainer while baseline procedures were maintained for all other trainers. The first day of intervention, Day 4, resulted in a dramatic increase (80%) in Darren's percentage of responses to low-*p* requests and continued to remain high through Day 8 (M = 84%). Responses to high-*p* requests issued by Trainer 1 were 100% for Days 4 through 8. For Trainers 2, 3, and 4, Darren's responses to low-*p* requests continued to remain low (M = 0%, 5%, 15%).

On Day 9 and continuing through Day 17, Trainer 2 implemented the high-*p* request sequence in addition to the first trainer, while Trainers 3 and 4 maintained baseline conditions. Darren's responses to low-*p* requests for Trainer 1 remained stable (M = 89%), whereas a dramatic increase (90%) was observed in his percentage of responding to low-*p* requests issued by Trainer 2. During Days 9 through 17, Darren's responses to low-*p* requests issued by Trainer 3 showed an increase ranging from 20% to 100%, even though the high-*p* sequence was not being implemented by this trainer. Additionally, these days yielded an increase in responses to low-*p* requests issued by Trainer 4, who also was not implementing the high-*p* sequence.

Finally, beginning with Day 18, all trainers issued only low-*p* requests to assess potential maintenance of the low-*p* responding gains. Darren's responses to low-*p* requests for Trainers 1, 2, and 3 remained at 100%. However, for Trainer 4 this first follow-up probe resulted in a decrease in responses to low-*p* requests (70%) that increased to 100% for all other days.

Two weeks following Day 22, data for the first weekly follow-up probe were collected. These data yielded responses to low-*p* and high-*p* requests of 100% for all four trainers. The second, third, and fourth follow-up probes (1-week intervals) revealed 100% responses for low-*p* and high-*p* requests implemented by all trainers.

DISCUSSION

A functional relationship was demonstrated between the high-*p* request sequence and increased responding to low-*p* requests of 2 young children with severe behavior disorders. In addition, introducing each youngster to multiple adults who were trained to implement the momentum sequence resulted in generalized responding to low-*p* requests issued by adults who did not implement high-*p* requests. The results thus lend support for nonaversive antecedent procedures to increase responding and decrease aggression (Harchik & Putzier, 1990; Horner et al., 1991; Mace & Belfiore, 1990; Mace et al., 1988; Singer et al., 1987) and the use of multiple trainers to produce generalization (Brady et al., 1984; Brady, Shores, McEvoy, Ellis, & Fox, 1987; Campbell, Brady, & Linehan, 1991; Fox et al., 1984; Gunter, Fox, Brady, Shores, & Cavanaugh, 1988; Stokes & Baer, 1977).

The theoretical framework from which this procedure was derived posits that increasing both the response rate *and* the reinforcement rate of a behavior in a response class (e.g., responding with requests) creates a momentum that propels responding within that class of behavior (Nevin et al., 1983). For both participants, the delivery of the three high-*p* requests increased their response rate, and reinforcement rate was increased by providing verbal and gestural praise upon the successful completion of these high-*p* tasks. Because both students exhibited high rates of nonresponse and therefore received little opportunity for teacher-delivered reinforcement prior to the study, it is plausible to attribute the results to behavioral momentum, a combination of increased requests and reinforcement. That is, behavioral momentum increased the occasions for reinforcement by structuring the sequence of high-*p* requests prior to the target behavior, which, in turn, increased the reinforcement delivered contingent on the responses to the high-*p* requests. For this study, then, behavioral momentum was a package consisting of increasing the rate of response and the rate of reinforcement. The individual components could not be analyzed separately. The examination of the

differential effects of increased rate of responding versus rate of reinforcement is worthy of future research.

In their classic paper on generalization, Stokes and Baer (1977) noted that the results of "train and hope" generalization procedures have not been impressive. In this study, the high-*p* procedure used to increase appropriate responding (without the presence of aggression) was not considered to be sufficient to produce generalized effects to other adults the boys would encounter in the community. Given (a) the effective results of the multiple exemplar (trainer) studies and (b) the number of adults the students encountered throughout the day, the use of multiple trainers was considered a sound and natural way to achieve generalized responding to other adults. The use of multiple trainers yielded generalized effects with Trainer 4 for Bobby and Trainers 3 and 4 for Darren. Dramatic increases in responding occurred for initial trainers only when the high-*p* sequence was implemented and remained at low levels of responding for those adults who were maintaining baseline conditions. For Bobby, it was not until the third trainer implemented the high-*p* request sequence that generalization occurred with the fourth trainer. Interestingly, when the second, and eventually the third, trainer used the high-*p* sequence, more robust effects were produced with all the trainers who had previously used the high-*p* sequence. That is, when Trainer 2 implemented the high-*p* sequence, greater increases in responding were seen with Trainer 1. Moreover, when Trainer 3 implemented the high-*p* sequence, greater increases in responding to requests were reported for Trainers 1 and 2, as well as generalized effects with Trainer 4. These results add to the research base using multiple trainers as a means for producing generalization (Brady et al., 1984, 1987; Campbell et al., 1991; Fox et al., 1984; Gunter et al., 1988; Stokes & Baer, 1977).

Anecdotal information gathered throughout the study showed decreases in the boys' aggressive and disruptive behavior and a general increase in both boys' participation in group activities. Through Day 21 for Bobby and Day 15 for Darren, the boys' nonresponse to low-*p* requests was accompanied by disruptive behavior (e.g., kicking, screaming, hitting, throwing objects). Because appropriate responding to requests was recorded only when the students responded without aggression, the occurrence of aggression associated with requests decreased as their responsiveness increased. For the remainder of the study, a nonresponse by Bobby, although infrequent, was not accompanied by any other disruptive behavior, whereas for Darren a nonresponse was accompanied only by an occasional low whining noise.

This study has implications of educational significance as well. First, the procedure can be a means of eliminating a possible obstacle to social role valorization described by Wolfensberger (1983). That is, our results support a growing group of tactics that enhance how a young child with behavior disorders is perceived and ultimately accepted by society, by providing him or her with the ability to interact with adults in a positive manner. Second, as Mastropieri and Scruggs (1987) noted, by decreasing the noncompliant behaviors that interfere with instruction, the amount of time available for learning is increased. This, of course, is a critical part of a program's effectiveness for young children. Finally, this procedure was easily delivered with minimal amounts of training and time away from instruction. The ease and applicability were further demonstrated by conducting this study in the students' regular education settings and with the teachers and aides each student encountered daily.

Further research is needed to investigate other questions about the utility of high-*p* requests. First, can this intervention be used as a crisis intervention? That is, once an individual has begun to have tantrums or act aggressively, can the use of high-*p* requests change the context of the behavior or break the reinforcing chain of behavior, as proposed by Horner et al. (1991) and Mace et al. (1988)? A second issue involves the types of personnel who might use high-*p* requests to increase the amount of instruction time they provide to individuals with challenging behaviors. For example, will this benefit physical or occupational therapists in their delivery of motor instruction and activities, or their encouragement of students to try tasks they perceive

as unpleasant (e.g., stretching to prevent contractures)? Finally, can this procedure be used with children with mild learning disabilities and behavioral disorders who have experienced a high degree of failure academically to increase the attempts to learn or perform tasks that may be challenging or have been historically associated with negative consequences?

The findings here support and expand two important bodies of research: (a) interspersed high-probability requests and (b) multiple trainers to produce generalization. Taken together, the utility of this study is that it offers individuals who teach children with behavior disorders a manageable intervention with potential to obtain generalized responses. Consequently, these responses will increase the range of opportunities (learning, instruction, social contacts, and independent living) for persons with disabilities.

REFERENCES

Brady, M. P., McDougall, D., & Dennis, F. (1989). The schools, the courts, and the integration of students with severe handicaps. *Journal of Special Education,* **23,** 43–58.

Brady, M. P., Shores, R. E., Gunter, P., McEvoy, M. A., Fox, J. J., & White, C. (1984). Generalization of an adolescent's social interaction behavior via multiple peers in a classroom setting. *Journal of the Association for Persons with Severe Handicaps,* **9,** 278–286.

Brady, M. P., Shores, R. E., McEvoy, M. A., Ellis, D., & Fox, J. J. (1987). Increasing social interactions of severely handicapped autistic children. *Journal of Autism and Developmental Disorders,* **17,** 375–390.

Campbell, B., Brady, M. P., & Linehan, S. (1991). Effects of peer mediated instruction on the acquisition and generalization of written capitalization skills. *Journal of Learning Disabilities,* **24,** 6–14.

Carr, E. G., & Durand, M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis,* **18,** 111–126.

Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1976). Stimulus control of self-destructive behavior in a psychotic child. *Journal of Abnormal Child Psychology,* **4,** 139–153.

Carr, E. G., Taylor, J., & Robinson, S. (1991). The effects of severe behavior problems in children on the teaching behavior of adults. *Journal of Applied Behavior Analysis,* **24,** 523–535.

Doleys, D. M., Wells, K. C., Hobbs, S. A., Roberts, M. W., & Cartelli, L. M. (1976). The effects of social punishment on noncompliance: A comparison with timeout and positive practice. *Journal of Applied Behavior Analysis,* **9,** 471–482.

Engelmann, S., & Colvin, G. T. (1983). *Generalized compliance training.* Austin, TX: Pro-Ed.

Fox, J. J., Gunter, P., Brady, M. P., Bambara, L. M., Spiegel-McGill, P., & Shores, R. E. (1984). Using multiple peer exemplars to develop generalized social responding of an autistic girl. *Monographs in Behavioral Disorders,* **7,** 17–26.

Gunter, P., Fox, J. J., Brady, M. P., Shores, R. E., & Cavanaugh, K. (1988). Nonhandicapped peers as multiple exemplars: A generalization tactic for promoting autistic students' social skills. *Behavior Disorders,* **13,** 116–126.

Harchik, A. E., & Putzier, V. S. (1990). The use of high-probability requests to increase compliance with instructions to take medication. *Journal of the Association for Persons with Severe Handicaps,* **15,** 40–43.

Haring, N. G., Liberty, K. A., & White, O. R. (1980). Rules for data-based strategy decisions in instructional programs: Current research and instructional implications. In W. Sailor, B. Wilcox, & L. Brown (Eds.), *Methods of instruction for severely handicapped students* (pp. 159–192). Baltimore, MD: Paul H. Brookes.

Haring, T., & Kennedy, C. (1990). Contextual control of problem behavior in students with severe disabilities. *Journal of Applied Behavior Analysis,* **23,** 235–243.

Horner, R., Day, H. M., Sprague, J., O'Brien, M., & Heathfield, L. T. (1991). Interspersed requests: A nonaversive procedure for reducing aggression and self-injury during instruction. *Journal of Applied Behavior Analysis,* **24,** 265–278.

Mace, F. C., & Belfiore, P. (1990). Behavioral momentum in the treatment of escape-motivated stereotypy. *Journal of Applied Behavior Analysis,* **23,** 507–514.

Mace, F. C., Hock, M. L., Lalli, J. S., West, B. J., Belfiore, P., Pinter, E., & Brown, D. K. (1988). Behavioral momentum in the treatment of noncompliance. *Journal of Applied Behavior Analysis,* **21,** 123–141.

Macfarlane, C., Young, K. R., & West, R. (1987). An integrated school/home overcorrection procedure for eliminating stereotypic behavior in students with severe multiple handicaps. *Education and Training in Mental Retardation,* **22,** 156–165.

Mastropieri, M., & Scruggs, T. (1987). *Effective instruction for special education.* Boston: College Hill.

Nevin, J. A., Mandell, C., & Atak, J. R. (1983). The analysis of behavioral momentum. *Journal of the Experimental Analysis of Behavior,* **39,** 49–59.

Parrish, J. M., Cataldo, M. F., Kolko, D. J., Neef, N. A., & Egel, A. L. (1986). Experimental analysis of response covariation among compliant and inappropriate behaviors. *Journal of Applied Behavior Analysis,* **19,** 241–254.

Patterson, G. R. (1982). *A social learning approach: Vol. 3. Coercive family process.* Eugene, OR: Castalia.

Singer, G. H. S., Singer, J., & Horner, R. H. (1987). Using pretask requests to increase the probability of compliance for students with severe disabilities. *Journal of the As-*

sociation for Persons with Severe Handicaps, **12,** 287–291.

Stokes, T., & Baer, D. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis,* **7,** 599–610.

Volkmar, F., & Siegel, E. (1979). Young children's responses to discrepant social communication. *Journal of Child Psychology and Psychiatry,* **20,** 139–149.

Wahler, R., & Dumas, J. (1986). Maintenance factors in coercive mother–child interactions: The compliance and predictability hypotheses. *Journal of Applied Behavior Analysis,* **19,** 13–22.

Wolfensberger, W. (1983). Social role valorization: A proposed new term for the principle of normalization. *Mental Retardation,* **21,** 234–239.

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